AS/A Level Mathematics Summer Work

In preparation for the start of the AS maths work, there are a number of key methods that you need to be happy with and that will be developed from early on in the course. The following questions cover a few of these areas.

Complete all of the following questions. Remember to show all workings. If you get stuck, use your GCSE maths revision notes or alternatively there are many resources available online, including www.mymaths.co.uk, BBC Bitesize or Corbettmaths. You could even come into school to ask for some help from a member of the maths department!

SURDS

A. Simplify the following surds

1.	$\sqrt{24}$	2.	$\sqrt{50}$	3.	$\sqrt{72}$	4.	$\sqrt{98}$	5.	$\sqrt{128}$
6.	$\sqrt{2}\times\sqrt{14}$	7.	$\sqrt{3}\times\sqrt{6}$	8.	$2\sqrt{5}\times 3\sqrt{8}$	9.	$\sqrt{9}\times 2\sqrt{20}$	10.	$\sqrt{30}\times\sqrt{5}$
11.	$\sqrt{12}\div\sqrt{3}$	12.	$10\sqrt{6}\div 2\sqrt{2}$	13.	$6\sqrt{15}\div 2\sqrt{3}$	14.	$27\sqrt{7}\div 3\sqrt{7}$	15.	$30\sqrt{42}\div 5\sqrt{6}$

ALGEBRA

B. **SIMPLIFYING** - Simplify the following expressions (expand the brackets where necessary).

1.	$5cd\times 3d^2$	2.	$4a^7\times 2a^3b^4$	3.	$9cd^3e\times 3de^2$
4.	$24t^7\div 18t^2$	5.	$12c^7d^3\div 9c^4d^6$	6.	$5a+4b+6a+7b$
7.	$9q-5p-6q-3p$	8.	$2(2f+5)$	9.	$9n(3-4n)$
10.	$p(y-z)$	11.	$5a+3(a+4)$	12.	$18-4(3f+5)+f$
13.	$4(7-x)+5(4+2x)$	14.	$9(3t-5)-6(4-6t)$	15.	$2x(x-y)+y(y-x)$

C. **EQUATIONS** - Solve the following equations.

1. $7x+4=39$
2. $35=3t-7$
3. $\frac{n}{3}-6=4$
4. $6a=21+3a$
5. $6p=60-4p$
6. $7u=5u-20$
7. $3(2x-1)=27$
8. $2(3b+4)=50$
9. $65=-4(5b+3)$
10. $5x+3=3x+11$
11. $3x-20=70-6x$
12. $-3x-7=x+13$
13. $8(x+1)=2(x-2)$
14. $4(5-x)=3(x-5)$
15. $8(x+2)=-2(3x+4)$

D. **QUADRATICS** - Expand and simplify the following brackets.

1. $(x+3)(x+2)$
2. $(a+4)(a-3)$
3. $(h-7)(h+9)$
4. $(y-3)(y-8)$
5. $(2y+1)(y+6)$
6. $(2p+3)(3p+1)$
7. $(3q+8)(2q-1)$
8. $(4b-7)(3b+2)$
9. $(3x-8)(6x-2)$
10. $(t+2)^2$
11. $(3p+2)^2$
12. $(4g-9)^2$

E. **FACTORISING** – Fully factorise the following expressions.

1. $2x+6$
2. $5t+rt$
3. $8gh-12g$
4. x^2-2x
5. $8ab^2-4a^2b$
6. $2x^3-4x^2$
7. $16v^2+40vt$
8. $16p^3q-15p^2q$
9. $9x^2+3x-6xy^3$
10. $4r^2t-6rt^3+2rt$
11. x^2+4x+3
12. $x^2-8x+15$
13. x^2+2x-8
14. x^2-36
15. $2x^2+7x+3$